ABSTRACT OF THE DISCLOSURE

A thermal barrier coating composition comprising a base oxide, a primary stabilizer oxide, and at least one dopant oxide is disclosed. Preferably, a pair of group A and group B defect cluster-promoting oxides is used in conjunction with the base and primary stabilizer oxides. The new thermal barrier coating is found to have significantly lower thermal conductivity and better sintering resistance. The base oxide is selected from the group consisting of zirconia and hafnia and combinations thereof. The primary stabilizing oxide is selected from the group consisting of yttria, dysprosia, erbia and combinations thereof. The dopant or group A and group B cluster-promoting oxide dopants are selected from the group consisting of rare earth metal oxides, transitional metal oxides, alkaline earth metal oxides and combinations thereof. The dopant or dopants preferably have ionic radii different from those of the primary stabilizer and/or the base oxides.